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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/668,376

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EXAMINER

FICK, ANTHONY D

ART UNIT

PAPER NUMBER

1753

MAIL DATE

DELIVERY MODE

10/03/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/668,376	Applicant(s) SUZUKI ET AL.	
	Examiner Anthony Fick	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-16 is/are pending in the application.
- 4a) Of the above claim(s) 10-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-9 and 13-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1 and 3-16 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>6/20/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Remarks

1. The previous action provisionally rejected claims 1-9, 13 and 14 on the grounds of nonstatutory obviousness-type double patenting over copending application 10/167,649. The claims within the copending application have been cancelled, thus making the rejection moot. The rejection is therefore withdrawn.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 4 through 9 and 13 through 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 61-108178, hereafter referred to as JP '178, in view of Oya (U.S.P.G.Pub 2001/0029977).

JP '178 discloses a solar cell module as shown in figures 1 and 3.

Regarding claim 1, figure 1 shows solar cells comprising a photoelectric conversion layer, a light receiving face electrode provided on a front surface of the layer, a rear electrode on the rear surface of the layer, and a protective sheet bonded to a surface of the rear electrode, 7. JP '178 discloses the sheet is made of a metal and is adhered to the electrode with solder or an adhesive (abstract), thus the metal foil adhered to the electrode is electrically connected.

Regarding claims 4 and 5, figures 2 and 3 show the metal foil bonded to a peripheral portion of the electrode and is patterned in an outer shape (circle for 2, mesh for 3).

Regarding claims 6, 7 and 8, figure 3 shows the mesh metal foil has an opening, the rear electrode being partly exposed through the opening. Further, the figure shows the openings have areas much bigger than 1.5% of the area of the foil (18 openings for the area, thus each opening is approximately 5% of the total metal foil area). The figure also shows the openings are rectangular.

Regarding claim 9, this claim is a product by process claim and the claim does not further limit the structure of the solar cell. Thus, JP '178 meets all the structural requirements of the claim.

Regarding claim 13, figure 1 shows a solar cell module comprising solar cells arranged in a planar array, connection members which connect the solar cells in series, 2, and a sealant for sealing the solar cells, 3. Each solar cell is disclosed as discussed above in relation to claim 1.

Regarding claim 14, figure 3 shows a mesh metal foil having openings, the rear electrodes being partly exposed through the openings. The module in figure 1 with the mesh metal foils will have the sealant, 3, contacting the rear electrodes through the openings in the mesh metal foil.

The difference between JP '178 and the claims is the requirement of a specific rear electrode.

Oya teaches a conductive paste for solar cells. The conductive paste contains aluminum powder, an organic vehicle and glass frit, an adhesive (paragraph 0006). The paste is fired to create the electrode (paragraph 0029). It is the position of the examiner that the glass frit of Oya is an adhesive as the glass frit connects the metal particles together and to the surface. With further regards to claims 15 and 16, the glass frit melts at higher temperatures and obtains adhesive properties. Therefore the glass frit is a heat sensitive adhesive.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the aluminum conductive paste as in Oya for the back electrode of JP '178 because the aluminum paste secures ohmic contact between the substrate and the back electrode and also improves the characteristics of the solar cell (Oya paragraph 0007). Because Oya and JP '178 are both concerned with solar cells, one would have a reasonable expectation of success from the combination. Thus the combination meets the claims.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '178 in view of Oya as applied to claims 1, 4 through 9 and 13 through 16 above, and further in view of Hayashi et al. (U.S. 6,288,323).

The disclosure of JP '178 in view of Oya is as stated above for claims 1, 4 through 9 and 13 through 16.

The difference between JP '178 in view of Oya and claim 3 is the requirement of a specific metal foil.

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Hayashi teaches a thin film solar cell module. Hayashi teaches the use of an aluminum foil placed underneath the solar cells (column 10, paragraph 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize an aluminum foil as in Hayashi as the metal protection sheet of JP '178 in view of Oya because aluminum foil improves the humidity resistance and water resistance to protect the solar cell from water (Hayashi column 10, paragraph 1). Also the selection of a specific thickness of foil is a design choice and absent any unexpected results would be obvious to those in the art to choose a specific thickness for a specific application. Because Hayashi and JP '178 in view of Oya are concerned with photovoltaic devices, one would have a reasonable expectation of success from the combination. Thus the combination meets claim 3.

Response to Arguments

5. Applicant's arguments filed August 6, 2007 have been fully considered but they are not persuasive. Applicant argues that the reference to Oya does not mention an adhesive impregnated sintered metal layer, the description of Oya is curiously devoid of any explicit mention of an adhesive, and neither the organic vehicle nor glass frit constitutes the adhesive. The examiner respectfully disagrees. As stated in the rejections above, it is the position of the examiner that the glass frit taught by Oya to be "impregnated" throughout the sintered electrode layer is an adhesive. The melting glass frit attaches the metal particles to each other and to the surface of the solar cell; the same functions of an adhesive. Further, the glass frit acquires these connecting properties when heated just as applicant's heat sensitive adhesive. As the claims only

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require an adhesive (or heat sensitive adhesive), any material that has adhesive properties meets the claim requirements. Also applicant has failed to show that glass frit cannot be an adhesive. Therefore the rejections are maintained.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Fick whose telephone number is (571) 272-6393. The examiner can normally be reached on Monday - Friday 7 AM to 4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Anthony Fick *ADF*
AU 1753
September 26, 2007


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SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700